YAKEEN NEET 2.0

2026

H/W solution

Basic Maths and Calculus (Mathematical Tools)

Physics

Homework Solution-08 (of Lec-13)

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① $\log_e x^n = n \log_e x$

② $\log_e (xy) = \log_e x + \log_e y$

③ $\log_e \left(\frac{x}{y}\right) = \log_e x - \log_e y$

④ $\log x^x = 1$

$\log_e e = 1$

$\log_{10} 10 = 1$

⑤ $\log_e 1 = 0$

$\log_{10} 1 = 0$

⑥ $\log_{e^n} x$ = log x on the Base e to the Power $\frac{1}{n}$

$$\log_{e^n} x = \frac{1}{n} \log_e x$$

Note

➤ $\log e^{25} + \text{Log}\, e^{4} - \log e^{10} =$

$\log_e e^{\frac{25\times4}{10}} = \log_e e^{\frac{100}{10}} = \log_e e^{10} = x = 2.303$

$\Rightarrow e^x = 10$

$\Rightarrow (3.14)^x = 10$

$x = 2.303$

$= \log_{10} 10^{25} + \lg_{10} 10^{4} - \lg_{10} 10^{10}$

$\Rightarrow \log_{10} 10^{\left(\frac{25\times4}{10}\right)} = \lg_{10} 10^{10} = 1$

$3^2 = 9$

$(3.14)^{2.303} = 10$

$\log_e e^{xy} = \log_e e^{x} + \log_e e^{y}$

$\log_e e^{\frac{x}{y}} = \log_e e^{x} - \log_e e^{y}$

$\log_e e^{\frac{xy}{2}} = \log_e e^{x} + \log_e e^{y} - \log_e e^{2}$

Question

Find value of given expression:

$\log_{10}(4 \times 10^{-4})$

$\log_{10}^{(4\times10^{-4})} = \log_{10}^{4} + \log_{10}^{(10)^{-4}}$

$= \log_{10}^{(2)^2} - 4\log_{10}^{10}$

$= 2\log_{10}^{2} - 4\log_{10}^{10}$

$= 2 \times 0.30 - 4 \times 1$

$= 0.6 - 4 = -3.4$

HW

$\log_{10}^{2} = 0.30$

$\log_{10}^{3} = 0.48$

$\log_e e^{xy} = \log_e e^x + \log_e e^y$

Note 2

$\sin\theta = \frac{P}{H}$

$\text{cosec}\,\theta = \frac{H}{P}$

- $\log_{10}(\sin\theta \cdot \text{cosec}\,\theta) = \log_{10} 1 = 0$
- $\log_{10} 25 + \log_{10} 40 = \log_{10}(25\times 40) = \log_{10} 1000 = \log_{10} 10^3 = 3\log_{10} 10 = 3$
- $\log_{10} 200 - \log_{10} 2 = \log_{10}\left(\frac{200}{2}\right) = \log_{10} 100 = 2$
- $\log_{10} 200 = \log_{10}(100\times 2) = \log_{10} 100 + \log_{10} 2$ (H/W)

$= 2 + 0.3$

$= 2.3$

$\Rightarrow \log 8^{16} = \log (2^3)^4 = \frac{4}{3}\log 2^2 = \frac{4}{3} = 1.33$

$\log e^{x^n} = n \log e^x$

$\log (e^n)^x = \frac{1}{n} \log e^x$

$\# \quad \log 27^3 = \log (3^3)^3 = \frac{1}{3}\log 3^3 = \frac{1}{3}$

$\log 10^{1000} = 3$

H/W $\log 1000^{10} = \log (10^3)^{10} = \frac{1}{3}\log 10^{10}$

$= \frac{1}{3}$

$\log_3 27^3 = \log_3 3^3 = 3 \log_3 3^3 = 3$ *

$(27)^{1/3} = 3$

- $\log_8 16 =$
- $\log_{27} 3$
- $\log_{100} 1000 = \log 10^{3} = \frac{3}{2}\log_{10} 10 = \frac{3}{2}$
- $\log_{10}(0.0001) = \log 10^{\left(\frac{1}{10^4}\right)} = \log 10^{-4} = -4\log_{10} 10 = -4$

$0.0001 = \frac{1}{10000} = \frac{1}{10^4}$

- $\text{Log}_{0.01} 10 = \log \frac{1}{100}^{10} = \log (10^{-2})^{10} = -\frac{1}{2}\log_{10} 10 = -\frac{1}{2}$

H/W

$(0.01)^{-\frac{1}{2}} = ??$

$$(0.01)^{-\frac{1}{2}} = ??$$

✓ $\log_{10} 0.001 =$

✓ $\log_{0.1} 10 =$

$\log_{64} 2 = \log_{2^6} 2 = \frac{1}{6}$

H/W $\log_{\frac{1}{4}} 4^{1/16} = \log_{4^1} 4^{16^{-1}} = \frac{-1}{-1} \log_4 4^{16} = 1 \log_4 4^2 = 2 \log_4 4$

$= 2$

$\log_4 4^{16} = \log_{\frac{1}{4}} 4^{1/16}$

THANK YOU